



## Editorial

## Why both gas and biomass are needed today to address the solid fuel cooking problem in India: A challenge to the biomass stove community



Before 150 years ago, the entire world used solid fuels for cooking, biomass and coal. Now more than 60 percent use gas and/or electricity – fuels that are basically clean at use. This is serious progress in terms of air pollution and health impacts, even if there are close to 3 billion people who have not yet been able to change.

Although there are far better biomass cookstoves than in the past, they have not progressed to the point that they are equivalent to gas in terms of reliability, flexibility, durability, efficiency, and cleanliness. Confirmatory evidence is that few, if any, women who have the option will change from gas to biomass, but many tens of millions do the reverse every year when given the chance. New biomass stoves are still coming, however, and we can hope that some will perform well enough over time in village households to be true competitors.

Cost and accessibility of gas fuels is still a barrier, and has led to a slower growth of gas than might have occurred with active policies to expand both access and supply to the poor. In India, for example, although growing at about 6 percent a year, LPG (liquefied petroleum gas)/PNG (piped natural gas) grew only fast enough to cover growth in the middle class. About 700 million of the poor were stuck in the *chulha* (open cookstove) trap for 25 years at least. Until recently, there were no special programs or efforts to accelerate growth in this population.

Starting in 2015, the GOI and OMCs (Government of India and the 3 oil marketing companies that market LPG) embarked on three major programs to actively promote LPG to the poor – each pioneering, aggressive, and relying heavily on both sophisticated social marketing and what is summarized in India as “JAM” (electronic bank accounts, biometric ID cards, and mobile phones). The first program, *Pahal*, shifted to paying subsidy fuel payments into people’s bank accounts and thus all LPG is now sold at international rates in the market, greatly reducing diversion of LPG to the non-household sector. The second, “Give it Up,” persuaded middle-class households to give up their subsidies to connect the poor. The third, *Ujjwala*, underway now, will provide connections to a total of 50 million poor households by 2019 and has reached 20 million already by April 2017.

In addition, although starting from a small base, PNG connections have been growing at more than 11% annually with a goal of 20 million by early next decade. Each of these frees up LPG to be moved to rural areas and reduces the LPG import burden.

The result is a remarkable increase in the historically modest expansion of clean fuel connections. The country expects to cover more than 90% of all households early next decade, although the official target is currently 80 percent by 2019. This at least doubles the historical rate of growth in clean cookfuel.

What is the cost of the LPG program in India? Not so easy to say because in 2015 the program first greatly cut the inherent waste (“leakage”) in the past subsidy system, saving hundreds of millions of dollars a year that was going to restaurants, etc instead of households, although difficult to estimate because of changes in world petroleum prices that were occurring as well. In addition, it persuaded, to date, some 13 million middle-class households to give up their subsidy that was shifted to poor households, something like a \$1.5 billion zero-sum internal “foreign aid” program over 10 years from the well-to-do to the poor. Much of the additional funding came from the CSR (corporate social responsibility) funds required to be spent by corporations by recent changes in Indian tax laws. The GOI has committed \$1.2 billion today to the current program through 2019, but this is less than the other major inputs and probably results in a net savings to the taxpayer from the situation before 2014. It was a brilliant idea to treat the old LPG subsidy as an asset, if shifted and targeted well, rather than a liability and embarrassment as most of us had thought.

I might note that none of this came from the health or environment sectors, which nevertheless will be benefiting. Nor has it affected the budget of the renewable energy ministry, which still runs the biomass stove and biogas programs.

As we all know, whenever a new technology of any sort is adopted, it rarely displaces the old instantly. High usage is still needed as well as reduction in use of the old polluting technology for full benefits to be obtained. As LPG seems nearly universally aspirational in India and the GOI/OMC programs have found a way to provide access to hundreds of millions of people, my and others research agendas now focus on ways to enhance usage – to shorten the “stacking” period in stove parlance, i.e. to substantially reduce the use of biomass as well. This is typical for health interventions – not enough just to deliver condoms, bednets, latrines, etc. – ways are needed to incentivize people to use them and to stop the unhealthy traditional practices.

Now the bottom line in terms of advanced biomass stoves. LPG (plus some natural gas and electricity) cooking for 90% of the population, even if achieved, still leaves some 150 million using poorly functioning traditional *chulhas* next decade. By itself, this population would be the eighth largest country in the world, and this is just in India. There is a huge opportunity to provide cleaner and more efficient stoves to these people who are not going to be able to afford or have access to gas in the next 15 years. As well as those in other countries. Divide the market into its appropriate segments and plan accordingly.

One of the lessons of the LPG experience in India, however, has not yet been fully taken onboard by the biomass stove community – the implications of scale. With 18,000 local distributors, each with 30–40

employees operating house to house, and plans to hire 10,000 more distributors underway, the LPG industry will soon have an army of a half million outside of cities to wield in promoting and servicing its product locally. And a well-functioning infrastructure from port to household to keep it going. And a high degree of quality control and transparency (national website with every LPG customer) and moving toward near universal cashless transactions via JAM. This is substantial job creation and contribution to the national economic agenda.

LPG is a unique fossil fuel. No one looks or drills for it, but it comes as a byproduct these days nearly all from natural gas development. With great expansion of natural gas from shale gas ("fracking"), there is suddenly a surfeit of LPG globally – the USA itself has gone in three years from a net importer to the largest exporter in history. Thus, it could be argued that LPG is found anyway will be used somewhere no matter what – autos, petrochemicals, or being flared are the main other uses besides households. Why not divert as much as possible to its highest social value use, cooking for the poor? In any case, all projections

indicate a large LPG/PNG supply for decades ahead although, of course, projections in this industry have sometimes gone astray.

Thus, I end by posing to the biomass stove community the same challenge posed once to the Indian LPG community. It is not enough just to have a cleaner cooking technology sitting in the shop, what is needed is to find an effective way to promote and provide these clean and efficient products to the 25 million households who will still need them in 2025. The biomass stove industry is going to have to think well beyond the technology itself, to how to disseminate at the scale needed and promote consistent usage over time and reduce use of traditional methods. In the places needed. To the women who need it.

**Kirk R Smith** is professor of global environmental health at the University of California Berkeley and a principal of the Collaborative Centre for Air Pollution Policy in New Delhi. He has worked with advanced biomass stoves in India and elsewhere since the 1980s and now focuses his research on ways to enhance usage of clean fuels such as LPG.